

## Ein Qedem 2. A Kebaran site in Nahal Galim, Mount Carmel, Israel

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**ABSTRACT** – *Ein Qedem 2 (EQ2) is an open-air Kebaran site (Early Epipalaeolithic period, ca. 22 000–17 500 calBP) located on the slope of Mount Carmel, Israel. The site is a part of a complex of prehistoric sites situated around the perennial spring of Ein Qedem and near the outskirts of the city of Haifa. EQ2, located near affluent sources of flint, presents ample evidence for Kebaran flint knapping. The rich flint assemblage provides valuable information concerning the microlithic industry, one of the hallmarks of the Epipalaeolithic period in this region.*

**IZVLEČEK** – *Ein Qedem 2 (EQ2) je najdišče na prostem, ki datira v obdobje Kebaran (zgodnji epipaleolitik, ok. 22 000–17 500 calBP), in se nahaja na pobočjih gore Carmel v Izraelu. Najdišče predstavlja del kompleksa prazgodovinskih najdišč, ki se nahajajo v okolici trajnega izvira Ein Qedem in na obrobju mesta Haifa. EQ2, ki se nahaja v bližini bogatih virov kremena, nudi veliko dokazov o kebaranski tehniki obdelave kamnitih orodij. Bogat inventar kremenovih orodij nudi dragocene podatke o mikrolitski industriji, ki predstavlja enega izmed razpoznavnih znakov obdobja epipaleolitika v tej regiji.*

**KEY WORDS** – *Ein Qedem 2; Mount Carmel Iris; Kebaran; Epipalaeolithic*

### The site and its environment

The Ein Qedem complex includes a series of prehistoric sites situated on the north-eastern bank of Nahal Galim, and on the northern bank of its tributary, Nahal Neder (Figs. 1–2). The site of Ein Qedem 2 (EQ2) is situated c. 200m a.s.l. near the perennial spring of Ein Qedem. It is located c. 700 metres north-east of Ornit Cave (*Olami 1965; 1984.46; Rosenberg, Nadel in press*) and only hundreds of metres downhill from the southern outskirts of the city of Haifa.

Nahal Galim basin, as part of the western Carmel range, is principally made up of the Main Chalk Complex of the Isfyé and Khureibe/Arqan Formations (*Picard, Kashai 1958; Segev, Sass 2006*). The local formation varies laterally from soft to hard chalk or limestone, and contains abundant flint horizons interbedded within the chalk layers. The Main Chalk

Complex is overlaid by a succession of reef-related limestone, dolomite, and an intermediate marl unit, comprising also the Muhraqa Formation. Locally developed volcanic rock units, mostly pyroclastic, are common as lenticular intercalations in the chalk (*Segev et al. 2002*).

The rocks are covered by shallow soils of the *Terra Rosa* type, combining a fine-grained texture with a high content of stones, and rarely showing any profile development (*Inbar et al. 1998*). Vegetation on the *Terra Rosa* soils is characterised by the *Quercus calliprinos-Pistacia Palaestina* maquis association (*Pollak 1984; Zohary 1962*). Today, the original vegetation is disturbed in many places, in some replaced by pine trees. Quarrying debris of flint extraction loci are found in abundance near the site, in Nahal Galim and Nahal Ornit (*Rosenberg, Nadel 2009*).

## The survey and excavations

The site was found during the prehistoric survey of Mt. Carmel conducted in the 1950s and 1960's by J. Olami, A. Ronen and their colleagues. They identified four separate prehistoric occurrences at Ein Qedem, termed Ein Qedem 1, 2, 3 and 4 (Olami 1975; 1984:49, 52, 56–60; Olami et al. 2003:57). While at Ein Qedem 1, 3 and 4, Olami and Ronen identified mainly Neolithic and Chalcolithic remains “*where axes and sickle blades predominate*” (Olami 1984:52), at EQ2 they also noted important Epipalaeolithic components, including bladelet cores and bladelets (Olami 1984:52).

The Epipalaeolithic remains were found scattered over three natural terraces of Nahal Neder (Figs. 3–4), 200m a.s.l. and approximately 60m above the Ein Qedem spring. They cover an area of c. 8000 square meters. The upper terrace (A) is 7m above the middle terrace and 19m above the lower terrace (C). On the terraces, shallow agglomerations or patches of sediments, usually dark heavy clay, with occasional small limestones (< 6cm), were noted between rock exposures. Historical and modern activities are evident in different parts of the site and its vicinity.

Following the survey of Olami and Ronen, a two-week excavation season took place at EQ2 in the 1970's (Ronen 1978). The excavation focused on the area where Epipalaeolithic finds were most common. During the excavation, four 1m<sup>2</sup> probes were excavated; two in the upper terrace and two in the middle terrace (Fig. 4). The sediments were excavated in 0.25m<sup>2</sup> units and 5cm horizontal spits. All sediments were taken to the Stekelis Museum at Haifa, and wet sieved through a 2mm screen. A thorough surface collection of 25m<sup>2</sup> was also conducted, with a grid set on the middle terrace, where the richest place of finds was observed.

In most squares, the excavation reached a maximum depth of c. 20cm below the present surface. However, excavation was halted only when bedrock was reached. No clear occupational layer or in situ features were found during the excavation, and it soon became clear that the site suffered from erosional processes. The excavators concluded that no clear difference, in terms of typology or technology, could be noted between the surface finds and the excavated material, and thus all remains should be regarded as belonging to a single cultural entity. In addition to the lithic assemblage, only a few basalt frag-

ments and isolated bones were noted in the excavation. Intrusive elements include some pottery shards and a few glass pieces.

Also, several bedrock features were noted by Olami. He reported of two bedrock mortars sets (16 and 18 specimens) in proximity to EQ2, as well as other bedrock features (Olami 1984:59). We inspected these and found a few additional isolated examples, including a few near the spring. These are usually large in diameter (Fig. 5); however, their size and depth varies. There are round and oval specimens, and some appear as ‘sets’. Their exact dating is unclear and further work is needed to determine to which site or sites of the Ein Qedem complex they should be attributed.

## The lithic assemblage

Thousands of flint items were found and collected at EQ2 in 1977, both in the excavated squares and the systematic surface collection of the middle terrace. The flint artefacts were stored at the Stekelis Museum after 1977. Recently, during a project of sorting the Museum's collections, we came across the unprocessed EQ2 boxes. We randomly selected 23 units from the excavated squares and 10 units from the surface collection. These were studied in order to characterise the assemblage in terms of techno-typological components, and thus assign it to a prehistoric cultural unit or a period. As no clear or significant differences were noted between the two studied samples, the results are presented together.

A variety of raw materials are present; the dominant colours are grey, beige and white (yellow and grey patinas are common). All types of raw materials could be found in abundance on Mt. Carmel, including items made of the locally available flint of Nahal Galim. Some of these sources, on the western slopes of Mt. Carmel, were recently surveyed by Druck (2004), who correlated flint sources with knapped flints found in the Middle Palaeolithic and Epipalaeolithic layers in the Mt. Carmel caves.

The studied assemblage includes 6039 flint items (Tabs. 1–2). Of these, 5429 (89.9%) items are debris, mostly chips (n = 5074, 84.0%). Tools comprise 28.0% of the tool and debitage assemblage (n = 171), while cores comprise only 3.8% (n = 23). The assemblage is bladelet oriented (32.1%), and together with blades (4.1%) the laminar elements clearly outnumber the flakes (14.1%).

Category	N	%
Tools	171	28.0
Cores	23	3.8
Primary elements, blades	14	2.3
Primary elements, flakes	36	5.9
Blades	25	4.1
Bladelets	196	32.1
Flakes	86	14.1
Core trimming elements	50	8.2
Burin spalls	9	1.5
<b>Sub-total</b>	<b>610</b>	<b>100.0</b>
Chunks	355	
Chips	5074	
<b>Sub-total</b>	<b>5429</b>	
<b>Total</b>	<b>6039</b>	

**Tab. 1. General breakdown of the flint assemblage.**

Tool type	N	%
Scrapers	1	0.6
Retouched blades	19	11.1
Retouched flakes	23	13.5
Notches and denticulates	4	2.3
Retouched fragments	21	12.3
Ouchtata bladelets	2	1.2
Retouched bladelets	14	8.2
Micro points	1	0.6
Truncated backed bladelets	1	0.6
Obliquely truncated backed bladelets	3	1.7
Truncated bladelets	1	0.6
Notched bladelets	2	1.2
Retouched bladelets, fragments	49	28.6
Backed bladelets, fragments	27	15.8
Varia	3	1.7
<b>Total</b>	<b>171</b>	<b>100.0</b>

**Tab. 2. Breakdown of tool types.**

The cores (Figs. 6–9) are mainly small amorphous bladelet cores (flake scars are scarce), and most were exploited until they were exhausted (a few were used to produce bladelets only 20mm long). Most cores are 39–59mm long, and we included here two smaller specimens that may represent small carinated scrapers. A few broken cores were noted as well. Many of the cores show minimal preparation and modification. The striking platform was prepared by one or a few cortical removals, and the bladelet production side was shaped as a narrow and almost flat surface. Most cores still bear much cortex on the rest of the surface.

Several bladelet cores are thin and the production surface is located on a narrow facet of the core. In some cases, the left side of the core was hardly touched (still with cortex) while only the right side was flaked to shape and control the debitage surface. Some of the cores were clearly abandoned because of hinges damaging their front. Primary elements (8.2%, mostly flakes) and core trimming elements (8.2%, Fig. 10) indicate local core preparation and reduction. The latter include crested blades, core tablets, rejuvenation pieces, and many items classified as varia.

Most tools in the sample are made on bladelets ( $n = 100$ , 58.5%). The rest include a single scraper, retouched blades (11.1%), retouched flakes (13.5%), notches and denticulates (2.3%), retouched fragments (12.3%), and three tools classified as varia (Fig. 11). The retouched flakes and fragments are usually small.

The microliths (Fig. 12) clearly attest to an Early Epipalaeolithic affiliation. Particularly important within the identifiable specimens are one micro-point and three obliquely truncated backed bladelets. No geometric microliths were identified within the sample or in other units that we inspected. Also conspicuous are two Ouchtata bladelets and several fragments with delicate retouch. However, within the microlithic group, fragments of retouched bladelets (28.6%) and of backed bladelets (15.8%) are the most abundant objects. Some of the microliths still bear cortex. Fragments are proximal, medial or distal. Width is usually between 5 and 7mm.

## Discussion

EQ2 was probably a small camp of a mobile group of hunter-gatherers, enjoying the favourable affluent conditions of Nahal Galim, with its rich environs of the woody Carmel eco-system and the open (a few kilometres wider than today) plains of the Mediterranean littoral, the perennial Ein Qedem spring and the proximity of the rich Nahal Galim and Nahal Ornit flint sources (Rosenberg, Nadel 2009).

The sampled assemblage and a random observation of many additional lithic materials from EQ2 clearly indicate that the site should be attributed to the Kebaran cultural complex of the Last Glacial Maximum (e.g., Bar-Yosef 1981). This conclusion is based on the dominance of bladelets among both tools and debitage. Moreover, most cores found are thoroughly exploited bladelet cores. Some of these bladelet cores demonstrate a typical narrow core reduction

sequence noted at other Kebaran sites (*Bar-Yosef 1991:330–331; Shimelmitz 2002:100*).

The chipped stone assemblage of EQ2 is characterised by its pronounced microlithic component. The tools show a clear preference for elongated and narrow bladelets, retouched in a variety of ways, from Ouchtata to backing. The micro-points and obliquely truncated backed bladelets are typical Kebaran, but the sample should be enlarged in order to determine to which Kebaran complex the site should be assigned. As we found neither geometric microliths nor lunates, it seems reasonable to suggest that the site was occupied by Kebaran groups during the earlier phase of the Epipalaeolithic period.

Kebaran sites are found throughout the southern Levant and were previously grouped into four clusters, their attributions based on the characteristics and frequencies of several microlithic types (*Bar-Yosef 1981; Bar-Yosef, Vogel 1987*). It is widely agreed today that the complex encompasses various facies that could be distinguished along chronological and geographical guidelines (*Bar-Yosef 1970; 1981; 1991; Bar-Yosef, Vogel 1987; Fellner 1995; Goring-Morris 1987; 1995; 2009; Goring-Morris, Belfer-Cohen 1998; Shimelmitz 2002*).

Kebaran sites are known in, and on the fringes of, the Carmel Range (including the coastal plain) at sites such as Haifa 1 and probably Haifa 2 (*Olami 1984:21–24; Yeshurun, Bar-Oz 2008*), Nahal Oren (*Bar-Yosef 1970:33–41; Noy et al. 1973; Stekelis, Yizraely 1963*), Sefunim (*Ronen 1984*), Raqefet Cave (*Lengyel 2009; Nadel et al. 2008*), and Kebara (*Bar-Yosef 1970; Bar-Yosef et al. 1992; Turville-Peter 1932*), and at more distant locations such as Ma'agan Michael (*Prausnitz 1969*), the Nahal Hadera sites complex (*Godfrey-Smith et al. 2003; Gophna et al. 1973; Kaufman 1976; Ronen, Kaufman 1976; Ronen et al. 1975; Saxon et al. 1978; Shimelmitz*

*2002*), and other occurrences on the Mediterranean Coastal Plain and the Carmel Range (see *Bar-Yosef 1970; 1991; Olami 1984*). EQ2 is thus one of several other Kebaran occurrences in this area of the southern Levant. In fact, this part of the range is one of the richest in terms of Early Epipalaeolithic sites, and is an area where both caves and open-air sites (situated on the slopes, terraces, and coastal plain hamra hills) were occupied by Kebaran groups.

In spite of the caution necessary when dealing with assemblages retrieved from sites and contexts that underwent erosional and other post-depositional processes that may have affected the final location of the finds, it seems that the large and homogeneous EQ2 flint assemblage provides us with important insights into the Early Epipalaeolithic period in the region. However, while our preliminary analysis – which included only a small fraction of the assemblage – allows us to suggest that the site should be incorporated within the Kebaran complex, further affiliation of the site to one of the traditions characterising this complex must await additional studies that will include an enlargement of the analysed sample and further morpho-metric observations. Bearing this in mind, and although the validation of the following still needs verification, it is possible that the position of EQ2 near the rich flint sources of Nahal Galim and Nahal Ornit is not random and could further hint at some degree of control of a Kebaran group or groups over this important resource and its procurement in the early phases of the Epipalaeolithic period.

#### ACKNOWLEDGEMENTS

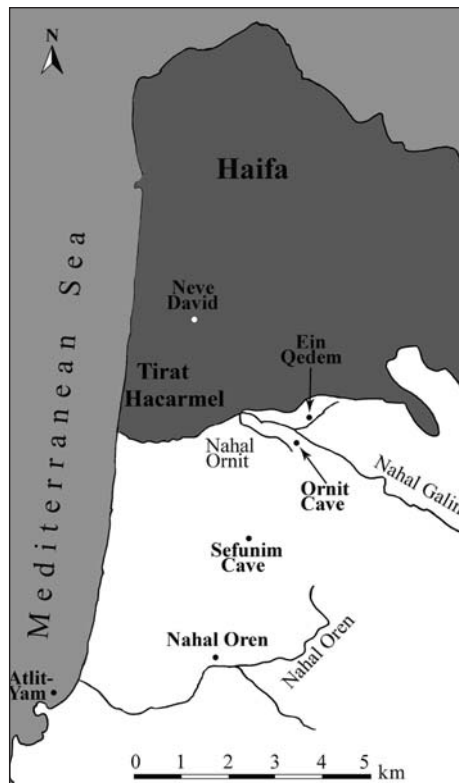
*We would like to thank V. Damov, A. Regev, A. Avshalomov, A. Krugliak, and I. Rosenberg for drawing and preparing the graphics. M. Davis and M. Lamdan participated in the field work during the 1970s.*



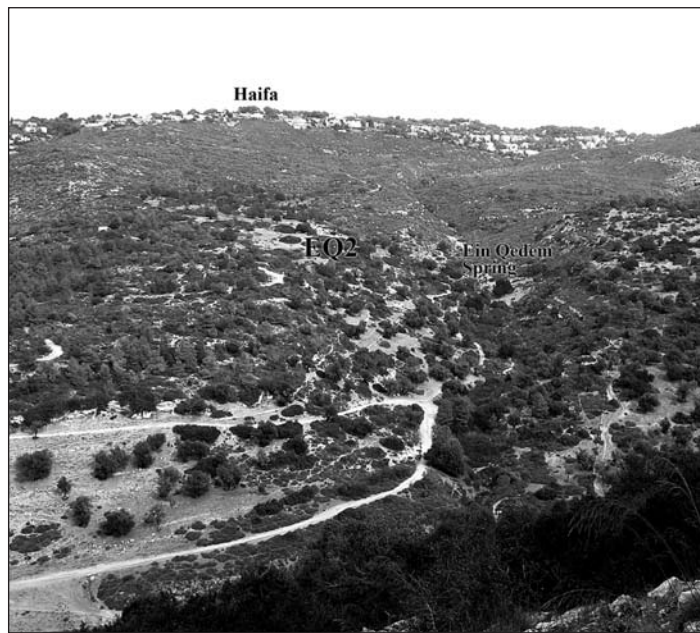
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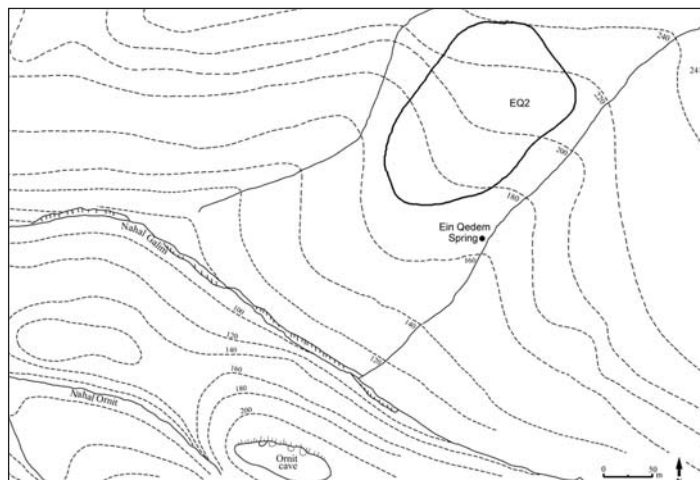
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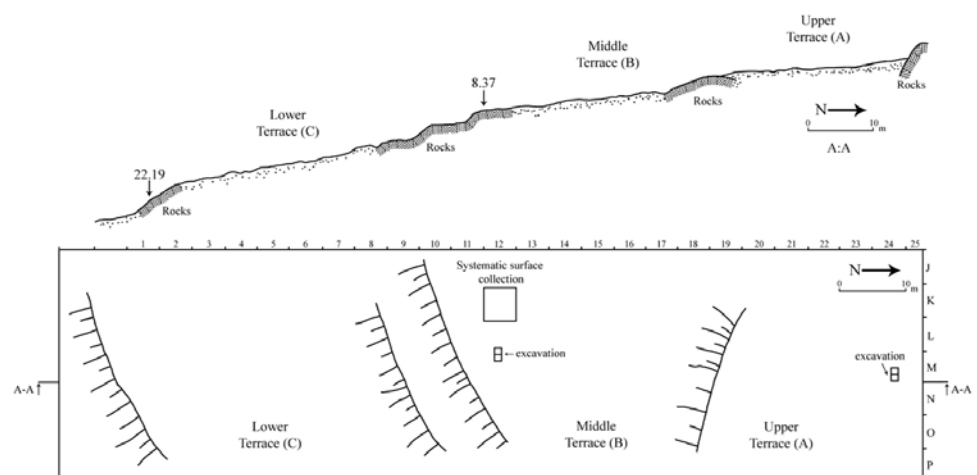
**Fig. 1.** Map showing the location of Ein Qedem and some of the sites mentioned in the text.



**Fig. 2.** A general view of Ein Qedem 2 and Nahal Neder from Ornit Cave (up on the hill are the southern outskirts slopes of the city of Haifa).



**Fig. 3.** A topographic map showing the location of EQ2.



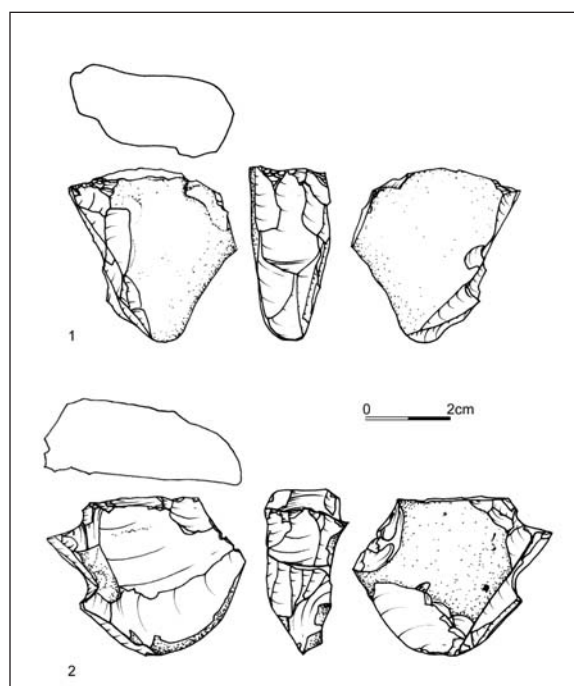
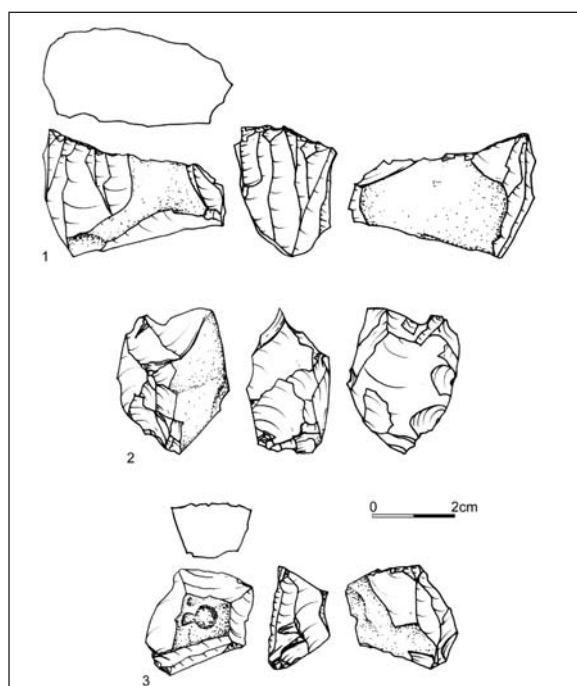
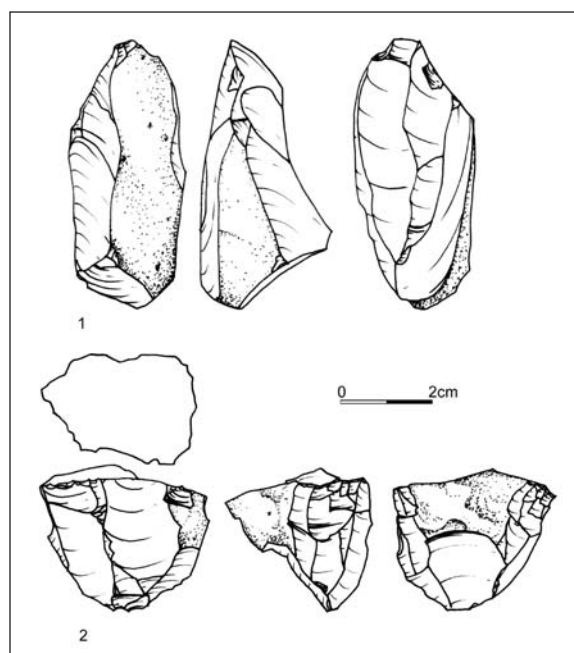
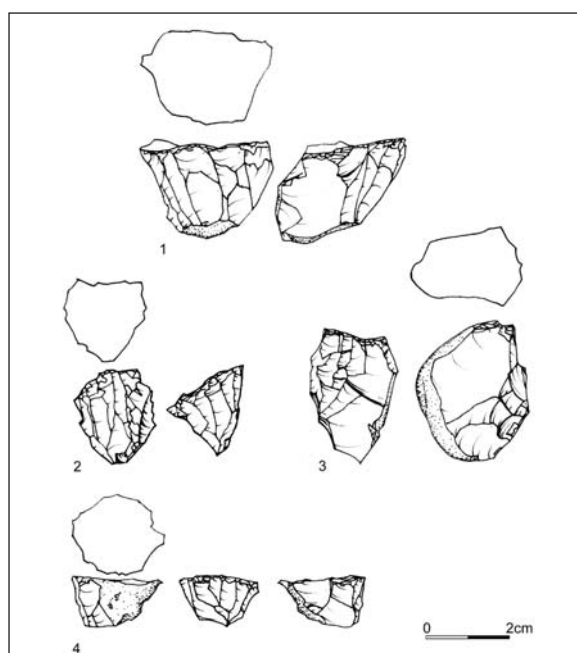
**Fig. 4.** Plan and section showing the location of excavation probes and the surface collection.



**Fig. 5. Bedrock features near EQ2.**



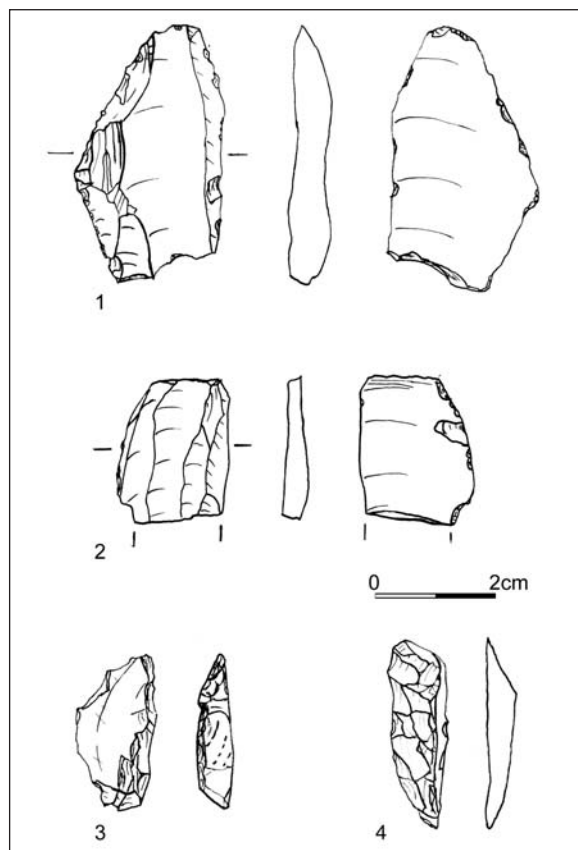
**Fig. 6. (below left) EQ2. Cores.**  
**Fig. 7. (below right) EQ2. Cores.**



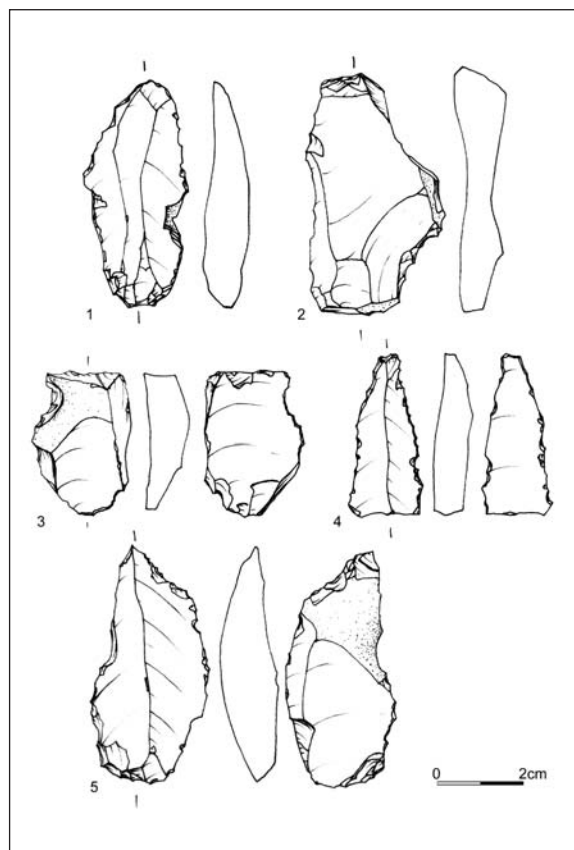
**Fig. 8. EQ2. Cores.**

**Fig. 9. EQ2. Cores.**

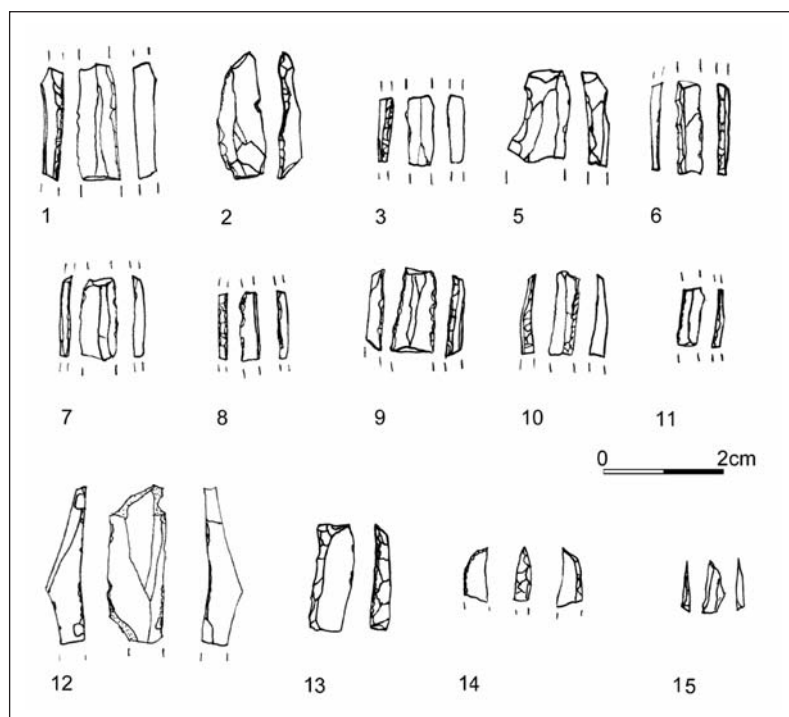




**Fig. 10. EQ2. Core trimming elements.**



**Fig. 11. EQ2. Tools.**



**Fig. 12. EQ2. Tools (microliths).**